transmitted to Sir Norman Lockyer, director of the Solar Physics Observatory, South Kensington.

In consideration of the valuable work so minutely and ably carried on at this Observatory in the departments of meteorology, general physics and magnetism, the publication *in extenso* of these daily and hourly observations becomes a question of national importance, in view, especially, of the large results now in course of evolution.

ALEXANDER BUCHAN.

NOTES.

THE presidential address delivered by Mr. Charles Hawksley at the Institution of Civil Engineers on Tuesday was very comprehensive in its scope. Being the first inaugural address delivered at the Institution since the commencement of the new century, the opportunity was taken of giving a retrospect of advances made in the past century in the more prominent branches of civil engineering. At the commencement of the nineteenth century engineering works were comparatively few in number. Railways, steamships, electric telegraphs, telephones, the use of electricity for lighting and motive-power, were all unknown. Lighting by means of coal-gas had only just been introduced, and even the steam-engine was then in a primitive stage. Looking backward, and comparing the condition of things a hundred years ago with the present state, the changes which science and invention have brought about certainly appear remarkable. But it is advisable not to rest satisfied with a complacent view of the progress made. There is a prospect as well as a retrospect, and it is essential to push forward into the new fields of work before they are occupied by other nations. This is the lesson which must be impressed upon the minds of the British people, and used to give their political leaders a sense of responsibility for national welfare in the future. Engineers are not usually inclined to accept the view that action is necessary if we are not to be beaten in the industrial war which is now going on, but Mr. Hawksley acknowledges that "British engineers and manufacturers cannot hope to possess in the twentieth century that practical monopoly which they enjoyed during a considerable part of the nineteenth century." The conditions have changed, and unless our engineers and manufacturers adapt themselves to the new environment they will be superseded by men of other nations more in touch with the times. Mr. Hawksley mentioned in his address the serious difficulties and disadvantages under which British manufacturers are placed by the lack in this country of acknowledged standards. A committee formed to consider the subject in June last decided unanimously that it was desirable to issue standard sections and standard specifications, and the Institution of Civil Engineers has taken the work in hand. Four committees dealing with different branches of industry have been formed and are now at work standardising the various sections used in engineering practice.

THE death is announced of Prof. Ralph Tate, F.L.S., F.G.S., professor of natural science in the University of Adelaide, South Australia. Tate was a naturalist of the old school, with a good knowledge of botany, field zoology and geology. His earliest researches were carried out in the neighbourhood of Belfast, and he published papers on the Lias and Cretaceous rocks in the *Quarterly Journal* of the Geological Society. In 1864 he was appointed museum assistant to that Society, a position which he occupied for about four years. During this period and up to the year 1876 he devoted his attention mainly to the Mollusca and especially to the Gasteropoda of the Lias. In conjunction with Prof. J. F. Blake, the well-known "Yorkshire Lias" was published in 1876. In that year Tate left England for the University of Adelaide, and henceforth his labours were devoted to the geology and natural history of Australia. In 1893 he was elected president of the Australian Association for the Advancement of Science. His later contributions to science dealt chiefly with the Tertiary Mollusca of Australia.

DR. A. H. BENNETT, only son of the late Prof. John Hughes Bennett, of Edinburgh, and author of several works relating to diseases of the nervous system, died on Friday last at the age of fifty-three.

AT the ordinary quarterly comitia of the Royal College of Physicians, held last week, it was resolved to send delegates to the congress on medicine to be held at Cairo in December 1902, and also to the International Congress in Medicine, to be held in Madrid in April 1903. A proposal from Mrs. FitzPatrick to found a lectureship in the college, accompanied by a draft for 2000*l.*, was accepted, and it was resolved to send the following expression of thanks on vellum and sealed with the College seal:—"The President and Fellows of the Royal College of Physicians of London, in comitia assembled, tender their cordial thanks to Mrs. FitzPatrick for her munificent gift of 2000*l.* for the purpose of endowing a lectureship on the history of medicine in memory of her late husband, Dr. Thomas FitzPatrick, a member of the college; they gratefully accept the same and undertake faithfully to administer the trust she has committed to them."

IT is stated by the Berlin correspondent of the *Times* that Prof. Paul Ehrlich, of Frankfurt-on-the-Main, has been enabled to devote himself to a special study of the disease of cancer in consequence of a bequest of the interest for three years of a sum of 500,000 marks dedicated to this purpose by a Frankfurt banker, the late Herr Theodor Stern. Other sums contributed by private individuals will bring up the amount to be devoted to this special investigation of cancer by Dr. Ehrlich to 40,000 marks, or 2000*l.* a year. In Berlin there exists a special committee for the investigation of cancer, which studies pathological accounts of cases and collects statistics and medical literature on this subject. Prof. von Leyden is at the head of the committee, and Prof. von Kirchner, of the medical department of the Ministry of Public Instruction, is one of its members.

MR. NORTHCOTE THOMAS has been appointed organising secretary to the Society for Psychical Research.

THE biennial dinner of the Physical Society of London will be held at the Hotel Cecil on Friday, November 15.

THE Christmas course of six lectures to young people, at the Royal Institution, will this year be delivered by Prof. J. A. Fleming, F.R.S. The subject will be "Waves and Ripples in Water, Air and Æther," and the first lecture will be delivered on Saturday, December 28.

THE new session of the Institution of Electrical Engineers will be opened on Thursday, November 21, when the premiums awarded for papers read or published during the session 1900–1901 will be presented, and the president, Mr. W. Langdon, will deliver his inaugural address.

THE Siberia-Oriental Section of the Russian Imperial Geographical Society will celebrate the fiftieth anniversary of its foundation on November 17/30.

THE scientific committee of the Aëro Club of Paris has decided to award the Deutsch prize of 100,000f. to M. Santos Dumont.

AN illustrated public lecture on Jamaica was delivered at the Imperial Institute on Monday by Mr. Herbert Thomas, who had resided continuously for the last twenty-five years in the island. In describing the principal products of the island, Mr.

Thomas said that the lamentable decay of the sugar industry could not be more forcibly illustrated than by the fact that whereas at the beginning of the nineteenth century 800 sugar estates had been under cultivation, there are now only 125. Even Jamaica rum is in less demand than formerly, having been largely superseded—even in the island itself—by whisky. On the other hand, the fruit trade of late years has made great strides; its value was 40,000*l.* in 1879 and 635,000*l.* in 1899. Tobacco is a product with a great future in store for it; also cocoa, the cultivation of which has recently largely increased and its quality improved.

THE conviction having arisen in the minds of many members of the American Philosophical Society that the time has come when the interests of useful knowledge in the United States can be greatly promoted by the holding, in addition to the Society's usual fortnightly meetings, of at least one general meeting in each year, the Society has authorised the holding of a general meeting in Easter week of next year, and a committee has been appointed to make the necessary arrangements. Members desiring to present papers, either for themselves or others, are requested to send to the secretaries at as early a date as practicable and not later than February 15, 1902, the titles of the papers, accompanied by a brief abstract, so that they may be duly announced on the programme, which will be issued immediately thereafter and which will give in detail the arrangements for the meeting.

THE "Chemical Society's Memorial Lectures," delivered between 1893 and 1900, have been published in a separate volume, which can be obtained from Messrs. Gurney and Jackson. There are twelve lectures in the volume, most of them important contributions to the history of chemistry and all of interest as descriptions of work to which the progress of modern chemical science is largely indebted. Several of the lectures were reported or abridged in these columns when they were delivered. The twelve chemists whose scientific careers are reviewed in the lectures, now rendered available in a convenient form, are Stas, Kopp, Marignac, Hofmann, Helmholtz, Lothar Meyer, Pasteur, Kekulé, Victor Meyer, Bunsen, Friedel and Nilson.

WE have received from the Home Office a copy of Dr. Le Neve Foster's general report on the minerals raised in the United Kingdom during 1900, and therein we learn that the value of the output, exclusive of the product of shallow quarries, was no less than 135,957,676*l.*, or nearly thirty-eight and a half million pounds more than that of 1899. The enormous increase is due partly to the larger quantity of coal produced, the excess being more than five million tons, but it is mainly owing to the higher average price per ton. To coal is due 89 per cent. of the total value of the output of our mines and quarries. Next in importance is iron-ore, the value of which is about four and a quarter million pounds. It is satisfactory to note that gold mining in Wales was carried on with an excellent margin of profit; no less than fourteen thousand ounces of bar gold were obtained, and the value was upwards of fifty-two thousand pounds.

TWO quarterly parts of a catalogue of Polish scientific literature, prepared by the bibliographical committee of the Department of Mathematics and Natural History of the Academy of Science at Cracow, have been received. The catalogue is intended to form a complete current list of Polish publications, commencing with the present year, and including separate works and dissertations, papers in scientific journals, and translations into Polish from other languages. It is also intended as a contribution to the international catalogue of scientific literature now in course of preparation. Each title is given alphabetically in its proper section under the name of the author, and a translation of the Polish title is added in English, French, Latin, German or Italian. The subject classification adopted in each part is as follows:—(A) pure mathematics; (B) mechanics; (C) physics; (D) chemistry; (E) astronomy; (F) meteorology (including terrestrial magnetism); (G) mineralogy (including petrology and crystallography); (H) geology; (J) geography (mathematical and physical); (K) palæontology; (L) general biology; (M) botany; (N) zoology; (O) human anatomy; (P) physical anthropology; (Q) physiology (including experimental psychology, pharmacology and experimental pathology; (R) bacteriology.

THE Report of the Royal Prussian Meteorological Institute for the year 1900 shows that steady progress is being made in the work of the various departments. The newly erected observatory on the Schneekoppe began to work regularly on June 1, 1900. The investigation of the upper air is actively carried on by means of kites, provided with self-recording instruments; on one occasion a height of 4255 metres was reached. The number of meteorological stations now amounts to some 200, in addition to 2200 rainfall stations; more than 1400 stations report thunderstorms and unusual occurrences either directly or monthly by post-cards. The results of the observations are published in annual, monthly and weekly reports, and the staff is encouraged to contribute discussions to various scientific journals.

THE Meteorological Office pilot chart of the North Atlantic and Mediterranean for the month of November shows that during September there was a rapid diminution in the quantity of ice on the western side of the Ocean, the latest report of a berg eastward of Newfoundland being as far back as September 11. In the strait of Belle Isle and eastward to the 50th meridian large and small bergs were still numerous, but they were noted as greatly thinned out since the previous month. Various local features of the Atlantic winds in November are dealt with, and as regards the ocean currents it is pointed out that at this season the Gulf Stream exhibits a decided slackening in the vicinity of Cape Hatteras, where the maximum velocities are reduced from 50 to 80 miles in October to as low as 30 to 45 miles. This, however, would appear to be a local check, for to south and north the rates are but slightly altered. On the African coast, between Capes Blanco and Palmas, a distance of more than 1000 miles, there is a westerly to north-westerly current setting away from the land. Mariners are cautioned as to the dangers from wrecks and derelicts, and particularly near the American coast, some portions of which are studded with sunken wrecks. A similar caution is given as to rollers down the west coast of Africa, which sometimes break with great violence in from nine to three fathoms. A new feature of the chart is the monthly discussion of the paths of barometric depressions affecting the Mediterranean. In November there are three main lanes each having its own influence on the winds experienced. The principal one proceeds from the Bay of Biscay across Corsica to Asia Minor, but another important one enters from the south-westward by the Strait of Gibraltar, or further north, passing across Sardinia and Italy, influencing the weather of the western basin, being the primary cause of the severe northerly and north-westerly gales there experienced. Both series of disturbances exhibit a tendency to lag on nearing Italy. The third group of depressions appears to traverse Algeria and Tunis, to enter the Mediterranean about the Gulf of Kabes, and move eastward across Cyprus.

THE autumn of 1899 was marked in the United States by a great development of the fall army-worm (*Laphygma frugiperda*), which probably was as injurious as any other insect that season, being destructive to a great variety of crops over a large

area. In *Bulletin* No. 29 of the entomological division of the U.S. Agricultural Department, Mr. F. H. Chittenden gives an account of this visitation and also of the life-history of this pest, as well as of the variegated cut-worm. The account of the former is the fullest hitherto published, but the sudden disappearance of the insect as a pest in 1900 prevented observations from being taken to complete its history. It is considered probable that the sudden destruction of this and other insect pests of apparently southern origin is due to peculiar atmospheric and other conditions in the late autumn. When the northern localities are restocked the following season, it appears to be owing to an influx of moths from the south.

WE have received two *Bulletins* (Nos. 28 and 30) from the Entomological Division of the U.S. Department of Agriculture, the one dealing with "Insect Enemies of the Spruce in the North-east" and the other recording some miscellaneous results of the work of the Division. Dr. A. D. Hopkins is the author of the former, while Dr. L. O. Howard and several other writers contribute to the latter. It appears that in New England and adjacent territories the valuable forests of red spruce (*Picea rubens*) have during the greater part of the last century been in a very unhealthy condition, numbers of trees dying over large tracts. The chief cause of the mischief is a beetle, described as a new species under the name of *Dentroctonus piceaperda*. After describing the life-history of this pest, the author suggests various remedies for checking its ravages. The more important contents of the second *Bulletin* include a dissertation on the ravages of the "differential grasshopper" in the Mississippi delta, experiments on insecticide, the carriage of disease by flies, the invasion of the codling moth in Idaho during 1900, and the influence of the weather on insect life in the same year. Mr. F. H. Chittenden, the author of the last-mentioned memoir, previously hazarded the suggestion that certain northern forms would continue to flourish after protracted cold weather, which would probably prove fatal to southern types invading the area under observation, and this prediction has been to a considerable extent verified. Both *Bulletins* are well illustrated, the plates in No. 28 being exceptionally good.

IN No. 8 of the *Bulletin* of the Royal Belgian Academy for the current year, M. Julien Fraipont publishes the first instalment of a re-exploration of the Engihoul cavern, Engis, carried out with the assistance of the "Elizabeth Thompson fund." In this communication the author describes the remains obtained from a bears' resort. These are provisionally assigned to *Ursus arvernensis*, *priscus*, *spelaeus*, *ferox* (=*horribilis*) and *arctus*. From comparison with the skull of a large brown bear from the Asiatic coast of Bering Strait, the author makes the suggestion that all these forms may eventually turn out to be specifically inseparable from *U. arctus*.

IN the October issue of the *American Naturalist* Prof. W. M. Wheeler brings to a close his dissertation on the compound and mixed nests of American ants, to which allusion has been made on two previous occasions in our columns. In his concluding paragraphs the author observes: "Wasmann has shown in detail why it is quite unnecessary to assume the existence of anything beyond instinct and simple intelligence in the ants which form compound and mixed nests. I should even be inclined to place a more moderate estimate than Wasmann on the psychical endowments of these animals. . . . Having arrived at the same conclusion as Wasmann, that there are no evidences of ratiocination in ants, we have reached the limits of our brief inquiry. This conclusion, however, even if it be extended so as to exclude all animals except man from a participation in this faculty, does not imply the admission of a qualitative difference between the human and animal *psyche*."

TO the *American Naturalist* Prof. Bashford Dean communicates some highly interesting notes on living nautili from the strait between the islands of Negros and Cebu in the southern part of the Philippine group. Hearing that these cephalopods were commonly captured by the inhabitants of those islands, Prof. Dean paid a visit to Negros, but as the time of year was not propitious he succeeded in obtaining only a few examples. In June, which is the best season, as many as twenty specimens are occasionally taken in a single fish-trap. These fish-traps, of which examples are figured by the author, are sunk by the fishermen in deep water (from about 225 to 350 fathoms), and the nautili are taken in considerable numbers. Not that they are an object of the fishery, for although their flesh is eaten it is but little esteemed, and the shells have till recently found little sale, although matters are improving in the latter respect. Prof. Dean gives several figures of the shell, with and without the soft parts, and shows how male are distinguishable from female specimens by the form of the aperture. Twenty hours was the longest time a specimen was kept alive. Nautili in this region appear to have a definite breeding-season, during which the author thinks it probable that the natives not unfrequently obtain eggs. Our readers will recall a description of nautilus eggs from New Guinea by Prof. Willey which appeared in our columns in 1897.

THE first part of a new Cryptogamic Flora of Germany, by Dr. W. Migula, has been issued, in connection with Thome' "Flora von Deutschland, Oesterreich, und der Schweiz."

DR. A. TOMMASI has sent us a copy of a memoir on a collection of Triassic fossils from the Valle del Dezzo, Italy, recently published in *Mem. Ist. Lombardo* (vol. xix. pt. 4). The fauna seems most nearly allied to that of St. Cassian; but a number of new species of molluscs and brachiopods are described.

THE October number of *Climate* is mainly devoted to the subject of malaria, and has in it a paper by Sir William MacGregor entitled "Malaria and its Prevention," articles on the malaria question, and the West African climate, also the general outlines of a course of ten health lectures, which, at the suggestion of the Governor, have recently been given to sanitary inspectors, hospital nurses, teachers and others at Lagos.

THE *Proceedings* of the Liverpool Geological Society (vol. ix. part 1, 1901) contain important communications by the late G. H. Morton on the Carboniferous Limestone series of North Wales, and of especial interest is his tabular list of the fossils, showing their range in the various subdivisions and their occurrence in the four districts of Llangollen, Flintshire, Vale of Clwyd and Llandudno, and Menai Strait and Anglesey. In the same publication Messrs. T. Mellard Reade and P. Holland deal with the Green Slates of the Lake District and discuss the subject of slaty cleavage. They maintain that real slaty cleavage is always accompanied by mineral changes in the body of the rock, which not only give the foliaceous character, but supply the necessary cement to bind together the overlapping constituents and convert what was originally mud into a rock possessing the tenacious and economically useful properties of slate.

THE clays and clay industries of Wisconsin form the subject of a memoir, by Dr. E. R. Buckley, which is published by the Wisconsin Geological and Natural History Survey (*Bulletin* No. vii., Economic Series, No. 4, 1901). Following the plan adopted in many American works, the author commences with the origin of clay, and passes on to the composition, classification, properties and behaviour of clays in general before he deals with the clay deposits of Wisconsin. These are both residual and transported, the residual clays being due to the decomposition of granite, greenstone, limestone, shale and other rocks. The transported clays are by far the more extensive, comprising

those of glacial, lacustrine, fluviatile and even wind-borne origin. The author describes the methods of manufacturing brick and drain tile, and then proceeds to record in detail his observations on the clays, and the local modes of working and manufactures in Wisconsin. In appendices he notes the methods employed in the examination of the clays in the field and in the laboratory, and he gives numerous analyses. A map and many other illustrations accompany this work.

MESSRS. JOHN WHELDON & CO. announce the publication of the first volume of the "Botany of the Færöes," edited by Prof. E. Warming. The present volume is occupied by the land and freshwater flora (phanerogamic and cryptogamic); the remaining volume will be devoted to the marine flora, to agriculture and gardening, and to other general subjects.

THE publication of the Kew *Bulletin of Miscellaneous Information* has been resumed, with Nos. 175–177, containing instalments of the Diagnoses Africanæ, Decades Kewenses, New Orchids, and Fungi Exotici. The *Bulletin* records, with regret, the retirement of Mr. George Nicholson from the curatorship of the Gardens, in which post he is succeeded by Mr. Wm. Watson. Mr. Nicholson had devoted himself largely to the extension and improvement of the arboretum, and was compiler of the hand-list of trees and shrubs grown in it.

THE *Journal of Applied Microscopy and Laboratory Methods* (published by the Bausch and Lomb Optical Co., Rochester, N.Y.) for October gives a full description, with photographic illustrations, of the botanical laboratory and the botanical garden of the Tokyo Imperial University, Japan. The University buildings comprise a herbarium, library, laboratories, museum, lecture-room, and rooms for a professor and three assistants. Special facilities are given for the study of bacteriology and fermentation. The curriculum for lectures comprises courses in morphology and physiology, in systematic botany, and in advanced physiology. The laboratory work includes courses in classification, morphology, histology, physiology, and embryology, as well as special research work. It is an important feature of the University curriculum that exclusive specialisation is not encouraged. Students who specialise in botany are required also to take courses in zoology, including histology and embryology, geology, palæontology, mineralogy, physiological chemistry, and bacteriology. There are special courses in the agricultural college of the University in forestry and agriculture. The botanic garden has been established for about two hundred and twenty years, and is about five acres in extent. In the same number of the *Journal of Applied Microscopy* is an account, with photographic illustrations, of the course of study in invertebrate zoology in the marine biological laboratory at Wood's Holl.

MESSRS. JORDAN AND SNYDER continue their valuable review of Japanese fishes in the *Proceedings* of the U.S. Museum, the last part we have received dealing with the so-called cardinal fishes (Apogonidæ). Two new species of the typical genus Apogon are described, while a new generic type receives the name *Telescopias gilberti*.

NOS. 1246 and 1247 of the *Proceedings* of the U.S. Museum contain lists, by Messrs. Robinson and Lyon, of mammals and birds recently collected in La Guaira, Venezuela; while in No. 1248 Dr. Stejneger deals with the reptiles and batrachians of the same locality. No. 1250 of the same serial is devoted to a review of the Atherine fishes of Japan, by Messrs. Jordan and Starks. In No. 1252 Dr. Stejneger describes a new bull-frog from Florida; and in the succeeding part Mr. N. Banks treats of certain spiders and other arachnids from Porto Rico.

THE U.S. Department of Agriculture has sent us Nos. 20 and 21 of the "North American Fauna," the former containing a revision of the typical skunks, by Mr. H. A. Howell, and the latter an account of the natural history of the Queen Charlotte Islands and Cook Inlet, Alaska, by Mr. W. H. Osgood. The chief feature in the first article is the proposed substitution of the name Chincha for the familiar Mephitis. In treating of the Queen Charlotte group Mr. Osgood mentions that although a supposed new species of reindeer has been recently described from Graham Island, it is more than doubtful whether any of those animals inhabit the group.

MESSRS. TOWNSON AND MERCER, of Camomile Street, London, E.C., have prepared a series of standard colour tubes —specially for the use of the wine trades—to which purchasers of sherry or other wine may refer any particular sample. As one of the factors in the sale of wine is a certain colour, it will be seen that if a trustworthy standard is established for comparison considerable expense and inconvenience will be saved. It is claimed that the tubes are absolutely permanent in colour and brightness, having been sterilised and made antiseptic, and, so far as we have been able to test it, the liquid in the hermetically-sealed glass cylinder forwarded to us has undergone no change. There is much to be said in favour of these standard tubes. It is much more trustworthy to refer a purchase to an accepted standard colour than to some tint which one endeavours to carry in the eye, or to a stored sample that may have undergone change. It is evident, however, that the range of colour tubes must be fairly extensive, particularly if they are to cover more than one class of wine; must be permanent in tint and brightness; and must have the approval of the wine trades.

THE brief description of the Hammer-Fennel tacheometer given in our issue of October 17 (p. 598) contains a sentence which Prof. Hammer desires to correct. Referring to the use of the instrument, the reviewer remarked:—"The diagram and mechanical adjustments are so arranged that by multiplying the observed displacement of the line from the zero by 20, the difference of altitude in metres will result, while another displacement multiplied by 100 gives the distance." This is not exactly the case. Prof. Hammer informs us that it is "not the displacements of any lines which have to be multiplied, but the section of the rod or stadia contained between the zero-line (horizontal wire) of the diagram and two other points of the diagram; these two points are indicated automatically in the diagram by raising or dipping the telescope."

A PRACTICAL aid to reasonable instruction in geography is provided by the *Geographical Teacher*, the first number of which has just been published. The new periodical is the organ of the Geographical Association (which exists for the purpose of improving the teaching of geography), and it is edited by Mr. A. W. Andrews and Dr. A. J. Herbertson. Mr. Douglas W. Freshfield, president of the Association, contributes an introduction, in the course of which he says that the aim will be to show that the question which Dr. Jowett once put to him, "Can you teach geography so as to make people think?" can be answered in the affirmative. The contributions to the first number substantiate this opinion. Among the subjects are methods of teaching geography, with their limitations and possibilities, the study of maps, geography of the world, photography as an aid to geography, and school excursions. The journal will be published three times a year by Messrs. George Philip and Son.

A TRANSLATION, by Dr. W. H. Thompson, of Prof. Pawlow's lectures on "The Work of the Digestive Glands," embodying the results of researches which were recently awarded the Nobel Prize of 11,000*l*., will be published immediately by Messrs. Charles Griffin and Co. This edition will include the later volume, entitled "The Experiment," &c., together with the notes of the most recent researches of Prof. Pawlow.

SEVERAL new editions of scientific books of established reputation have recently been received. The fourteenth edition of Naumann's well-known "Elemente der Mineralogie," edited by Prof. F. Zirkel, has been published by Mr. Engelmann, Leipzig (London: Williams and Norgate). The book stands in the first rank of treatises on mineralogy, and is likely to maintain this position while it is so well kept in touch with scientific progress by revised editions.—A similar standard work is Gray's "Anatomy: Descriptive and Surgical," the fifteenth edition of which, edited by Messrs. T. Pickering Pick and R. Howden, has been published by Messrs. Longmans, Green and Co. The entire work has undergone revision, and the section on embryology has been considerably amplified. The volume will thus secure the attention of students for some time to come.—The third edition of Prof. A. H. Church's "Chemistry of Paints and Painting" has been published by Messrs. Seeley and Co. An elaborate and appreciative review of this book appeared in these columns nearly ten years ago (vol. xlv. p. 243). The plan remains the same as in the first edition, but many slight changes have been made and new pigments, or new varieties of old pigments, are described. In the four last chapters Prof. Church gives "adequate evidence of the instability of several favourite pigments largely used by painters in water-colour during the eighteenth and nineteenth centuries."—Mr. Walter Scott has published the third edition of Mr. Havelock Ellis's book on "The Criminal," which was reviewed in these columns when the first edition appeared (vol. xlii. p. 75, 1890). Since then increasing attention has been given to criminal anthropology, and Mr. Ellis gives a valuable statement of the present position of the subject. His book has been enlarged by more than one hundred pages, and much new material has been examined and summarised.

WE have received a copy of Prof. Letts' report on the scheme of sewage purification for Belfast and its probable effects on the Lough. In this report Prof. Letts first deals in a simple way with the chemical nature of sewage and the various methods of sewage disposal. He then deals with the subject of the vast deposits of sea-lettuce (*Ulva latissima*) which accumulate on the Belfast foreshore and, undergoing decomposition, produce serious nuisance. It is shown that the development of the sea-lettuce, which is extraordinarily rich in nitrogen, is associated with the presence of sewage in sea-water and that it thrives wherever an ordinary sewage effluent escapes into sea-water. Coming next to the proposed method of treating the Belfast sewage by double contact with bacteria beds and the discharge of the resulting effluent into the Lough, Prof. Letts concludes from his experiments that the bacteria beds are dispersers rather than converters of nitrogen, that is to say, they liberate a large proportion of sewage nitrogen in the gaseous form. Hence the effluent from such beds is unlikely to stimulate the growth of the noxious green seaweed, and Prof. Letts considers it probable that the proposed system of sewage treatment will eventually suppress the growth sufficiently to put an end to the existing nuisance. In a series of recommendations appended to his report, Prof. Letts suggests the reclamation of large tracts of foreshore and more systematic removal of the decomposing weed. He thinks it probable that by allowing the sewage effluent to flow into tidal ponds containing sea-water and sea-lettuce the nitrogen content might be reduced almost to the vanishing point. The lettuce could be regularly removed and used advantageously as a manure.

THE additions to the Zoological Society's Gardens during the past week include a White-fronted Capuchin (*Cebus hypoleucus*) from Central America, presented by Mr. G. B. Apostoloff; two Syrian Bulbuls (*Pycnonotus xanthopygos*) from Tayif, Arabia, presented by Mr. G. P. Dovey; a Hocheur Monkey (*Cercopithecus nictitans*, ♀) from West Africa, a Simpae Monkey (*Semnopithecus melalaphus*, ♂) from Sumatra, three Ogilby's Rat Kangaroo (*Bettongia penicillata*) from Australia, a Zebra (*Equus* —— ♂), four Young Lions (*Felis leo*, ♂ ♂ ♂ ♂), a Caracal (*Felis caracal*) from Abyssinia, an Indian Antelope (*Antilope cervicapra*), a Ruddy Ichneumon (*Herpestes smithi*) from India, a Goshawk (*Astur palumbarius*), European; five Smooth-clawed Frogs (*Xenopus laevis*) from Africa, deposited; twelve Changeable Troupials (*Quiscalus versicolor*), six Painted Terrapins (*Chrysemys picta*), two American Box Tortoises (*Cistudo carolina*), a Copperhead (*Ancistrodon contortrix*), two Horrid Rattlesnakes (*Crotalus horridus*) from Pennsylvania, three White-eyebrowed Finches (*Zonotrichia leucophrys*), three Lark Buntings (*Calamospiza bicolor*), three Mexican Quails (*Callipepla squamata*), two Painted Box Terrapins (*Cistudo ornata*), five Poinsett's Lizards (*Sceloporus torquatus*, var. *poinsetti*), ix Lesser Horned Lizards (*Phrynosoma modestum*), a Say's Snake (*Coluber catenifer*, var. *sayi*), a Confluent Rattlesnake (*Crotalus confluentus*), two Testaceous Snakes (*Zamenis flagelliformis*), two Western Diamond Rattlesnakes (*Crotalus atrox*) from Pecos, Texas; two Common Rattlesnakes (*Crotalus durissus*), two Couper's Snakes (*Spilotes corais*, var. *couperi*) from Marion co., Florida, received in exchange.

OUR ASTRONOMICAL COLUMN.

THE PERIOD OF ALGOL.—Prof. S. C. Chandler has made a further investigation of the minor inequalities of the period of Algol. These have probably escaped notice up to the present owing to their being so minute as to be of the same order as the errors of observation.

This later inquiry indicates that the deviations of the observed from calculated times of minima have been periodic, distinct changes occurring in the course of a few months, but it does not appear that the periodicity is of a regular character. More frequent and continuous observations of the minima, however, are required to decide this question.

It appears from the curves representing these minor inequalities that the length of the principal of them is about 15,000 periods, this period from the most recent computations being

2d. 20h. 48m. 55·60s. +
3·694s. sin (133° − 0°·024 E.) + 1·784s. sin (16° − $\frac{1}{18}$° E.)

Tables are then given showing the influence of including these new terms in the comparison of observed with computed epochs of minima (*Astronomical Journal*, vol. xxii. pp. 39–42, 1901.

THE MELBOURNE OBSERVATORY.—The annual report of Mr. P. Baracchi, the Government astronomer at Victoria, has recently been issued. All the usual routine work in astronomy, meteorology, terrestrial magnetism, &c., has been carried on as usual, and considerable progress has been made in the endeavour to lessen the accumulated arrears of unreduced records.

With the astrographic instrument 261 plates have been obtained, including 63 chart triple exposures, 49 chart single exposures, and 39 catalogue plates. The chart series of single exposures of 60 m. is now complete. The new Repsold micrometer made from the designs of Sir David Gill is found to work very satisfactorily, and measurements are made at twice the former speed, dealing with about 170 stars per hour.

The Milne seismograph is now adjusted in position and a continuous photographic record of seismic disturbances will be started as soon as possible.

ROYAL ALFRED OBSERVATORY, MAURITIUS.—The annual report of Mr. T. F. Claxton, director of the Royal Alfred Observatory, has recently been distributed, giving details of progress made during the year 1900. The meteorological and magnetic observations have all been continued as in previous years, but much of the astronomical work with the prime vertical and equatorial had to be abandoned on account of the unhealthiness of the district. Photographs of the sun with the photoheliograph were taken whenever weather permitted, and 311 negatives with 301 prints were forwarded to the Solar Physics Committee.